

IN THE CLAIMS

1. (Previously Presented) A computer-implemented method for constructing a single vector representing a semantic abstract in a topological vector space for a semantic content of a document on a computer system, the method comprising:
 - storing a semantic content for the document in computer memory accessible by the computer system;
 - identifying a directed set of concepts as a dictionary, the directed set including a maximal element at least one concept, and at least one chain from the maximal element to every concept;
 - selecting a subset of the chains to form a basis for the dictionary;
 - identifying lexemes/lexeme phrases in the semantic content;
 - measuring how concretely each lexemes/lexeme phrase is represented in each chain in the basis and the dictionary;
 - constructing state vectors in the topological vector space for the semantic content using the measures of how concretely each lexemes/lexeme phrase is represented in each chain in the dictionary and the basis;
 - superpositioning the state vectors to construct the single vector; and
 - storing the single vector as the semantic abstract for the document.
2. (Canceled)
3. (Original) A method according to claim 1, wherein superpositioning the state vectors includes adding the state vectors using vector arithmetic.
4. (Original) A method according to claim 1, wherein superpositioning the state vectors includes weighting the state vectors.
5. (Original) A method according to claim 1 further comprising normalizing the single vector.
6. (Previously Presented) A method according to claim 1, wherein:
 - storing a semantic content includes:
 - storing the document in computer memory accessible by the computer system;
 - and

extracting words from at least a portion of the document;
constructing state vectors includes constructing a state vector in the topological vector space for each word using the dictionary and the basis; and
the method further comprises filtering the state vectors.

7. (Previously Presented) A computer-readable medium containing a program to construct a single vector representing a semantic abstract in a topological vector space for a semantic content of a document on a computer system, the program comprising:
storing software to store a semantic content for the document in computer memory accessible by the computer system;
identification software to identify a directed set of concepts as a dictionary, the directed set including a maximal element at least one concept, and at least one chain from the maximal element to every concept;
selection software to select a subset of the chains to form a basis for the dictionary;
identification software to identify lexemes/lexeme phrases in the semantic content;
measurement software to measure how concretely each lexemes/lexeme phrase is represented in each chain in the basis and the dictionary;
construction software to construct state vectors in the topological vector space for the semantic content using the measures of how concretely each lexemes/lexeme phrase is represented in each chain in the dictionary and the basis;
superpositioning software to superposition the state vectors to construct the single vector; and
storing software to store the single vector as the semantic abstract for the document.

8. (Canceled)

9. (Original) A program according to claim 7, wherein the superpositioning software includes addition software to add the state vectors using vector arithmetic.

10. (Original) A program according to claim 7, wherein the superpositioning software includes weighting software to weigh the state vectors.

11. (Original) A program according to claim 7 further comprising normalization software to normalize the single vector.

12. (Previously Presented) A program according to claim 7, wherein:
the storing software includes:
storing software to store the document in computer memory accessible by the computer system; and
extraction software to extract words from at least a portion of the document;
the construction software includes construction software to construct a state vector in the topological vector space for each word using the dictionary and the basis; and
the program further comprises filtering software to filter the state vectors.
13. (Previously Presented) An apparatus on a computer system to construct a single vector representing a semantic abstract in a topological vector space for a semantic content of a document on a computer system, the apparatus comprising:
a semantic content stored in a memory of the computer system;
a lexeme identifier adapted to identify lexemes/lexeme phrases in the semantic content;
a state vector constructor for constructing state vectors in the topological vector space for each lexeme/lexeme phrase identified by the lexeme identifier, the state vectors measuring how concretely each lexeme/lexeme phrase identified by the lexeme identifier is represented in each chain in a basis and a dictionary, the dictionary including a directed set of concepts including a maximal element and at least one chain from the maximal element to every concept in the directed set, the basis including a subset of chains in the directed set; and
a superpositioning unit adapted to superposition the state vectors into a single vector as the semantic abstract.
14. (Original) An apparatus according to claim 13, wherein:
the state vector includes an associated threshold distance; and
the apparatus further comprises:
search means for searching the topological vector space for a second document with a second semantic abstract within the threshold distance associated with the first semantic abstract for the first document; and
retrieval means to retrieve the second document.

15. (Canceled)

16. (Original) An apparatus according to claim 13, wherein the superpositioning unit includes a vector arithmetic unit adapted to add the state vectors.
17. (Original) An apparatus according to claim 13 further comprising a normalization unit adapted to normalize the single vector.
18. (Previously Presented) An apparatus according to claim 13, wherein: the apparatus further comprises:
a lexeme extractor adapted to extract lexemes/lexeme phrases from the semantic content; and
filtering means for filtering the state vectors; and
the state vector constructor is adapted to constructing a state vector in the topological vector space for each lexeme/lexeme phrase using the dictionary and the basis.
19. (Previously Presented) A computer-implemented method for constructing minimal vectors representing a semantic abstract in a topological vector space for a semantic content of a document on a computer system, the method comprising:
storing a semantic content for the document in computer memory accessible by the computer system;
identifying a directed set of concepts as a dictionary, the directed set including a maximal element at least one concept, and at least one chain from the maximal element to every concept;
selecting a subset of the chains to form a basis for the dictionary;
identifying lexemes/lexeme phrases in the semantic content;
measuring how concretely each lexemes/lexeme phrase is represented in each chain in the basis and the dictionary;
constructing state vectors in the topological vector space for the semantic content using the measures of how concretely each lexemes/lexeme phrase is represented in each chain in the dictionary and the basis;
locating clumps of state vectors in the topological vector space;
superpositioning the state vectors within each clump to form a single vector representing the clump;
collecting the single vectors representing each clump to form the minimal vectors; and

storing the minimal vectors as the semantic abstract for the document.

20. (Previously Presented) A computer-readable medium containing a program to construct minimal vectors representing a semantic abstract in a topological vector space for a semantic content of a document on a computer system, the program comprising:

- storing software to store a semantic content for the document in computer memory accessible by the computer system;
- identification software to identify a directed set of concepts as a dictionary, the directed set including a maximal element at least one concept, and at least one chain from the maximal element to every concept;
- section software to select a subset of the chains to form a basis for the dictionary;
- identification software to identify lexemes/lexeme phrases in the semantic content;
- measurement software to measure how concretely each lexemes/lexeme phrase is represented in each chain in the basis and the dictionary;
- construction software to construct state vectors in the topological vector space for the semantic content using the measures of how concretely each lexemes/lexeme phrase is represented in each chain in the dictionary and the basis;
- clump location software to locate clumps of state vectors in the topological vector space;
- superpositioning software to superposition the state vectors within each clump to form a single vector representing the clump;
- collection software to collect the single vectors representing each clump to form the minimal vectors; and
- storing software to store the minimal vectors as the semantic abstract for the document.

21. (Previously Presented) An apparatus on a computer system to construct minimal vectors representing a semantic abstract in a topological vector space for a semantic content of a document on a computer system, the apparatus comprising:

- a semantic content stored in a memory of the computer system;
- a state vector constructor for constructing state vectors in the topological vector space for each lexeme/lexeme phrase in the semantic content the state vectors measuring how concretely each lexeme/lexeme phrase is represented in each chain in a basis and a dictionary, the dictionary including a directed set of concepts including a maximal element

and at least one chain from the maximal element to every concept in the directed set, the basis including a subset of chains in the directed set;

a clump locator unit adapted to locate clumps of state vectors in the topological vector space;

a superpositioning unit adapted to superposition the state vectors within each clump into a single vector representing the clump; and

a collection unit adapted to collect the single vectors representing the clump into the minimal vectors of the semantic abstract.